Pesticides linked to bee deaths

For the first time, a chemicals company has paid compensation to beekeepers for loss of colonies. **Michael Gross** reports.

The mysterious disappearance of entire bee colonies, known as colony collapse disorder or CCD, has mystified researchers for a couple of years now (see Curr. Biol. *17*, R389). It was first observed in the US, where highly industrialised bee-keeping practices mean that colonies are shipped across the continent to work large areas of a single crop. But whether this stress or other factors are responsible is of increasing concern to US agriculture, which relies on bees for the successful pollination of many major crops.

In most European countries, by contrast, bee-keeping remains in the hands of small local businesses and even amateurs, who pride themselves on more bee-friendly practices. But similar losses of bee colonies have been reported from various locations across Europe; however, it is still unclear whether CCD will take hold in Europe to the extent it already has in the US.

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With European beekeepers now on high alert, the loss of thousands of colonies in one region of Germany this spring sounded major alarm bells. In Baden-Württemberg, particularly along the Upper Rhine, 700 beekeepers reported the loss of around 11,500 colonies.

Unlike the puzzling CCD in the US, investigators quickly placed the blame on a group of products containing the toxin clothianidin, an insecticide of the neonicotinoid class developed and produced by the chemical company Bayer. By the end of June, the company agreed to compensate the beekeepers with a total sum of two million euros.

Environmentalists claim that Bayer got off too lightly, pointing out that the company's sales of clothianidin products amount to 240 million euros every year. However, this agreement is a landmark in that it is the first instance of a producer of insecticides paying the price for lost bees.

Clothianidin products such as 'Poncho Pro' are typically used to protect seeds, especially for rapeseed and maize. Bayer insists that the product as such is safe for bees as long as farmers sow the pre-treated seeds according to the instructions. If they scattered the seeds too high above the ground or in strong winds, the toxin may get dispersed, and bees may get exposed to it. Neonicotinoids have also come under suspicion of harming bees in earlier die-offs in France and in the US.

In May, the Federal Office of Consumer Protection and Food Safety (Bundesamt für Verbraucherschutz und Lebensmittelsicherheit, BVL) withdrew the licences for all clothianidin products. In a recent official statement, the authority identifies batches of maize seed as the bee killers. Investigations suggest that the clothianidin had not been bound strongly enough to the seeds, resulting in fine powders rich in the insecticide. When farmers used these faulty batches in a certain kind of sowing equipment that tends to disperse such powders in the air, the toxin ended up on flowers where it affected bees.

As these problems appeared to be specific to maize, the BVL has now allowed rapeseed treated with such products to be sown again, subject to the limitations, which also specify which kind of sowing equipment may be used. The authority also ruled that in the future the binding of the insecticide to the seeds must be improved.

The permissions for other products including those used for maize seeds are still pending until those seeds can be made safe. Environmentalists are firmly against their reintroduction. Manfred Krautter, a chemist working for Greenpeace, said: "Nature is not a laboratory. It can't be right to have toxins in circulation which are allegedly safe only under laboratory conditions. Every gust of wind can disperse such powders."

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Bee sanctuary

Britain's Bumblebee Conservation Trust (BBCT) and the Royal Society for the Protection of Birds (RSPB) in Scotland have together launched the world's first sanctuary dedicated to supporting bumblebees.

The sanctuary forms part of the RSPB's Vane Farm nature reserve beside Loch Leven in central Scotland. Habitat loss has already led to the extinction in Britain of three species of bumblebee and many others are facing steep declines in numbers. "Hay meadows and clover lays are now seldom seen in today's farmland, leaving little for bumblebees to feed on," says Ben Darvill, director of the BBCT. "By sowing a legume-rich seed mixture, funded by Scottish Natural Heritage, we have recreated the sort of habitat which allows bumblebees to thrive."

The sanctuary managers have created a pathway through the newly planted meadows to allow visitors to see the bumblebees. The sanctuary has also attracted the rare blaeberry bumblebee down from surrounding hills, and managers are now hoping it will eventually attract the critically endangered great yellow bumblebee.

"The partnership with BBCT has allowed us to convert what was a normal-looking green field into a spectacular wildflower meadow that grabs all of your senses when you walk through it," says Dave Beaumont, head of reserves ecology for RSPB Scotland.

Seeing and hearing the multitude of bumblebees, butterflies and hoverflies, says Beaumont, "reminds me of what we have lost from much of the countryside".

Blossoming: New planting at a reserve in Scotland is boosting bumblebee numbers. (Photo: RSPB-Images.)